Qualcomm's Proposed Air-to-Ground Service In the 14.0-14.5 GHz FSS Uplink Band

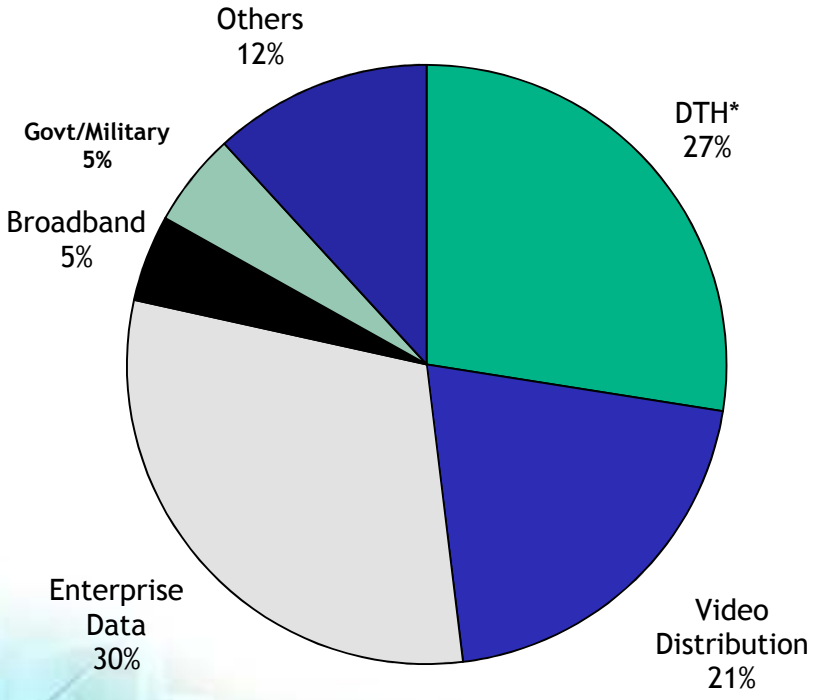
RM-11640

SIA MEMBER COMPANIES

Ku-band is Used for a Broad Range of Satellite Services in North America

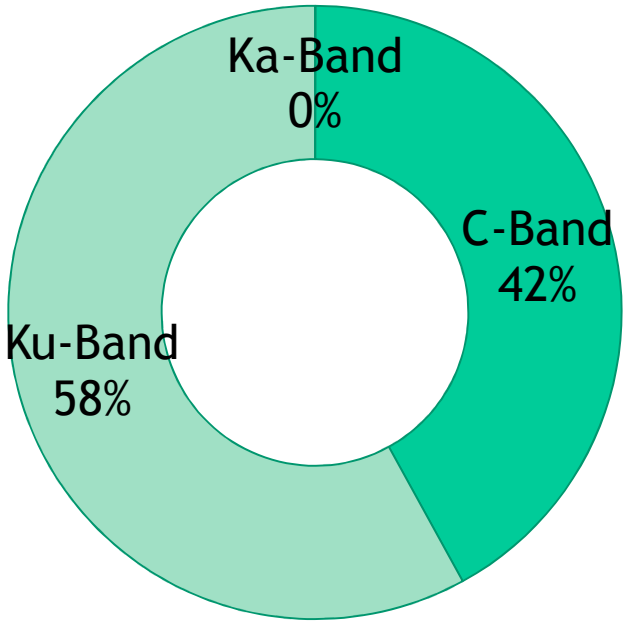
Distribution of 36 MHz Transponder-Equivalents for Ku-Band, 2011

Total TPE 563.1



Distribution of 36 MHz Transponder-equivalents per Band, 2011

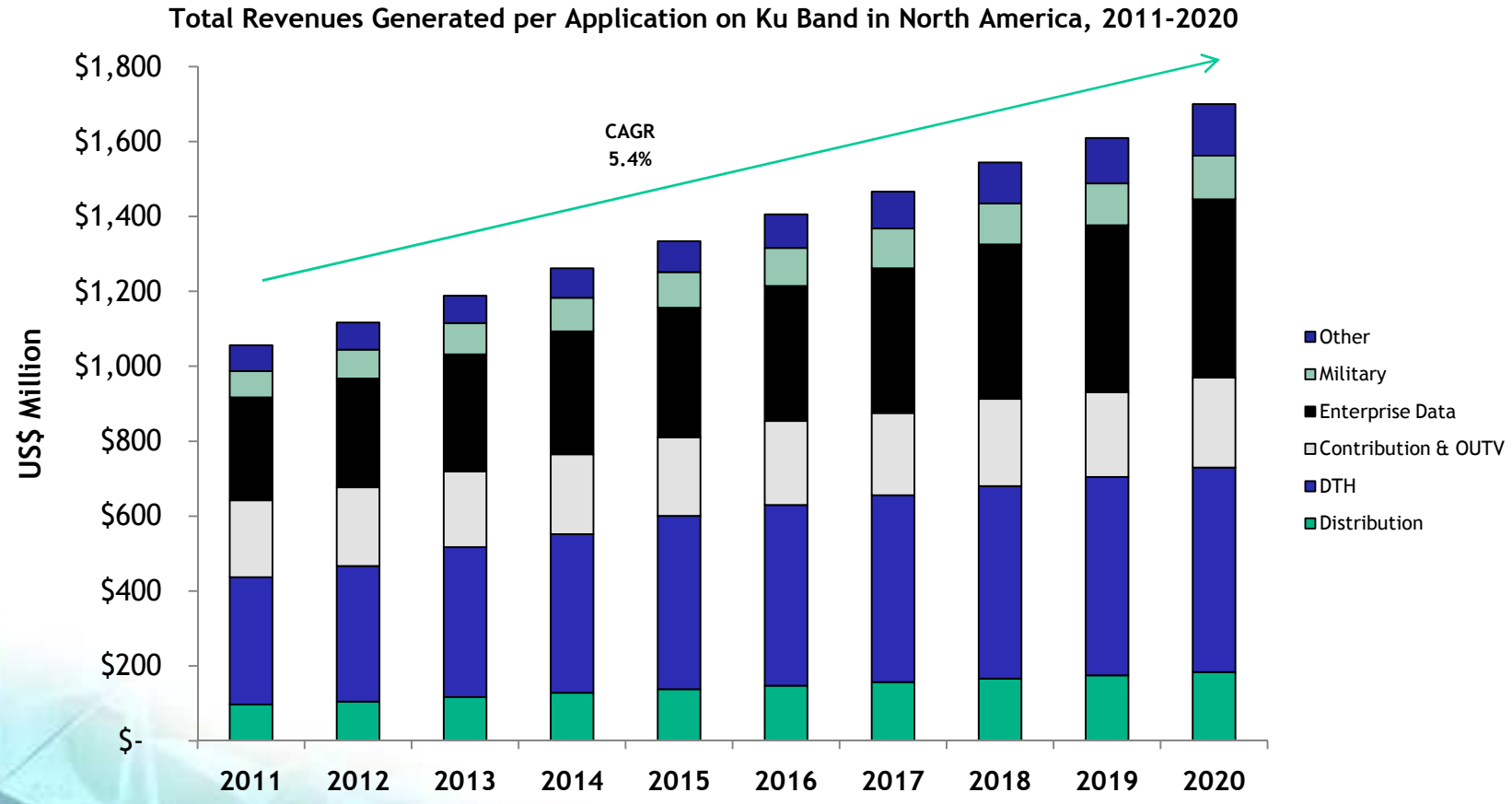
Total TPE 970.9



* DTH segment includes both DBS and DTH-FSS

Source: NSR "Global Assessment of Supply and Demand", 8th Edition, 2011

Expected Ku-band Revenue Growth in North America



* DTH segment includes both DBS and DTH-FSS

Source: NSR "Global Assessment of Supply and Demand", 8th Edition, 2011

Ku-band Earth Stations Are Ubiquitously Deployed

- Under the U.S. Table of Allocations, the Fixed Satellite Service (FSS) is the sole primary service allocated to the 14.0-14.5 GHz.

- There are at least 81 geostationary satellites licensed by or authorized to serve the United States using the 14.0-14.5 GHz band.
  - Each satellite costs $250-$300 million to construct, launch and insure.

- This exclusive allocation has enabled technical innovation and ubiquitous deployment of earth stations throughout the United States.
  - Over 600,000 VSAT earth stations
  - Many larger fixed earth stations
  - Earth stations on vessels and vehicle-mounted earth stations (rulemakings recently completed)
  - Aircraft earth stations (rulemaking pending)

Qualcomm's Proposed Air-to-Ground Service Will Likely be Disrupted by FSS Deployment

- SIA members commissioned a technical analysis of the likely impact of widespread FSS deployment into Qualcomm's proposed Air-to-Ground (ATG) service in the 14.0-14.5 GHz band.
- Stephen McNeil of Telecomm Strategies analyzed multiple interference scenarios and concluded as follows:
  - There is a real potential for interference from a single VSAT into an ATG return link. Multiple VSATs located in the vicinity of the ATG GS will exacerbate the problem.
    - Given the large number of currently deployed VSATs within CONUS, plus the fact that GS sites would generally point north, while VSATs generally point south, it is expected to be extremely difficult to find GS sites that are sufficiently free from VSAT interference.
    - Further, any GS installation would need to accept the risk and uncertainty that a future VSAT(s), or other type of FSS earth station(s), would be deployed in its immediate vicinity.
  - The ATG forward link either cannot successfully operate due to the combined interference received from multiple VSATs and multiple non-VSAT FSS transmissions that will be visible from an ATG aircraft antenna, or at a minimum, its throughput will be reduced relative to Qualcomm's assessment.
  - An ATG aircraft's forward link can be disrupted or experience long-term interference from a single AMSS aircraft. The antenna gain coupling assumption that was used in reaching this conclusion is quite conservative. Multiple AMSS aircraft would only increase the likelihood of repeated disruption or long-term interference.
  - An ATG return link can be disrupted or experience long-term interference from a single AMSS aircraft. Multiple AMSS aircraft would only increase the likelihood of repeated disruption or long-term interference. Multiple AMSS aircraft would only increase the likelihood of repeated disruption or long-term interference.
- In these circumstances, the viability of Qualcomm's service is questionable.

Unresolved Questions

- Viable ATG service in the presence of FSS interference?
  - What data rates can realistically be achieved?
  - Are such data rates commercially viable?
  - Is it practical or realistic to re-locate ATG ground stations to avoid future FSS interference?

- Impact on FSS operations conducted on a secondary or non-harmful interference basis?
  - Launch and Early Orbit Phase (LEOP) operations
  - Satellite relocations
  - Aeronautical services (subject to pending rulemaking)

- Auctioning spectrum for a secondary service?

Conclusions

- For these reasons, and for the reasons set out in SIA's comments, SIA urges the Commission to:
  - Reject Qualcomm's petition for rulemaking for a new secondary Air-to-Ground service.
  - Expeditiously complete the long-pending rulemaking proceeding for AMSS in the Ku-band frequencies.